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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,740	01/26/2004	John P. Jackam	025000-00200	2847

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EXAMINER

MCCAIG, BRIAN A

ART UNIT	PAPER NUMBER
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1797

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12/10/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/766,740	Applicant(s) JACKAM ET AL.	
	Examiner BRIAN MCCAIG	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 77-81, 83-89, 99, 122, 198 and 225 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 77-81, 83-89, 99, 122, 198, and 225 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office action is based on the remarks filed August 28, 2009, for the 10/766740 application.
2. Cancellation of claims 1-76, 82, 90-98, 100-121, 123-197, 199-224, and 226 are noted.
3. Claims 77-81, 83-89, 99, 122, 198, and 225 are pending.
4. New grounds of rejection necessitated by applicant's amendment filed May 6, 2008, follow.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 77-81, 83, 85-89, 99, and 122 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Loon (US 2588435) in view of Kenneally et al (WO 99/24387).**

7. In the discussions that follows regarding Kenneally et al, reference is made to the corresponding US Patent Publication, US 6965043 B1.

8. van Loon teaches a process wherein free fatty acids or fatty acids and glycerides [column 1, lines 1-3] are esterified with an alcohol in excess having a relatively high boiling point such as glycerol (or, glycerin) [column 1, lines 44-47; column 2, lines 6-10 and lines 23-33; & example 1] with or without a catalyst [column 2, lines 28-30] at a temperature that is greater than the boiling point of water but less than the boiling point of the alcohol [column 1, line 52 to column

Art Unit: 1797

2, line 6] and under a vacuum [column 2, line 6] to form tri-, di-, and mono-glycerides [column 3, lines 15-19]. The reaction product is then subjected to an alcoholysis reaction with a low molecular weight alcohol such as ethanol or methanol [column 3, lines 19-23 & column 4, lines 54-56] to form fatty acid alkyl esters. The glycerol (glycerin) is separated from the fatty acid alkyl esters [column 2, line 33 to column 3, line 3 & column 4, lines 46-53] by water washing. The alcoholysis reaction is catalyzed by alkali hydroxide compounds or alkali compounds of polyhydric alcohols [column 3, lines 61-65].

9. van Loon does not appear to explicitly disclose the step of purifying the fatty acid alkyl ester rich stream by distillation to produce a biodiesel having an acid number less than 0.8 mg KOH/g and a total glycerin content less than or equal to 0.240% by mass.

10. However, Kenneally et al, which is concerned with a process of making high purity fatty acid alkyl esters, discloses a step of purifying the aforesaid alkyl esters in a distillation stage. The distillation conditions are similar to those disclosed in the instant application. For example, the distillation temperature ranges from 163 to 246° C and the pressure ranges from 0.005 to 30 mm Hg (9.7e-5 to 0.58 psi) [column 7, lines 25-27 & lines 32-34]. While Kenneally et al does not disclose the acid number and glycerin content, it is expected that the limitations are inherent since the distillation conditions are similar to that disclosed in the instant application and the feedstocks to the distillation column are also similar (e.g., Kenneally et al discloses that the fatty acid alkyl esters are obtained from a fatty acid source including fatty acid glycerol esters to form fatty acid esters which are further reacted with a lower alcohol such as methanol to form fatty acid alkyl esters -- see column 4, lines 36-54).

Art Unit: 1797

11. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the process of van Loon with the distillation of Kenneally et al in order to recover the unreacted glycerin that is a reaction product and recycle it to the glycerolysis reaction as taught by van Loon [column 2, lines 40-52] as well as to produce a biofuel having a low acid value (less than 1) instead of biofuels having undesirably high acid values (greater than 1) [see column 2, lines 28-53 of Kenneally et al]. Therefore, the invention as a whole would have been *prima facie* obvious at the time the invention was made.

12. With respect to claim 81 and 122, while van Loon does not appear to explicitly disclose purifying the glycerin (glycerol), it would have been obvious to one of ordinary skill in the art to purify the glycerin since the reference discloses recycling the glycerin to the glycerolysis reactor, and the reference also discloses that the product from the glycerolysis and alcoholysis reactions is a soap-containing glycerol [see example]. Therefore, in order for the glycerol to be re-used in the glycerolysis reaction, the soap-containing components would necessarily need to be removed.

13. With respect to claim 87, van Loon does not appear to explicitly disclose the stoichiometric amount of glycerin required for glycerolysis. However, as previously mentioned, the reference disclosed that glycerin is added in excess [see, e.g., column 2, lines 24-28]. The reason for adding the glycerin in excess according to van Loon is to affect the equilibrium of the conversion of the free fatty acids. Therefore, the concentration of the glycerin is a result-effective variable; that is, a variable that achieves a recognized result. In this case, the result is the level of conversion of the free fatty acids in the feed. The applicant is reminded that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the

Art Unit: 1797

optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235.

14. With respect to claims 198 and 99, van Loon does not appear to disclose the two CSTRs. However, it has been held that the mere duplication of parts has no patentable significance unless a new and significant result is produced. See *In re Harza*, 274 F.2d 669, 124 USPQ 378 and MPEP 2144.04.

15. Similarly, with respect to claim 89, in *In re Dilnot*, (319 F.2d 188, 138 USPQ 248) the court held the claimed continuous operation would have been obvious in light of the batch process of the prior art.

16. **Claim 84 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Loon (US 2588435) in view of Kenneally et al (WO 99/24387) as applied to claims 77-81, 83, 85-89, 99, and 122 above and in further view of Peter et al (US 2002/0111504).**

17. Neither van Loon nor Kenneally et al appear to explicitly disclose that the feedstock is conditioned to remove solids.

18. However, it is well known to one of ordinary skill in the art to remove suspended compounds corresponding to the solids of the instant application in a feedstock comprised of oils and fats such as the low grade fatty stocks of van Loon [column 1, lines 7-10] as evidenced by Peters et al [paragraphs 0002 & 0003], which also discloses the esterification of free fatty acids by glycerol similar to that of van Loon [paragraph 0004].

19. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the process of van Loon with the removal of suspended compounds taught by Peters et al in order to be able to isolate the free fatty acids from the oils and fats and contaminants

Art Unit: 1797

contained therein as disclosed by the latter reference [paragraphs 0002-0004] for use in the production of fatty acid alkyl esters. Therefore, the invention as a whole would have been *prima facie* obvious at the time the invention was made.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN MCCAIG whose telephone number is (571) 270-5548. The examiner can normally be reached on M-F 8-430.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BAM
12/2/2009

/ROBERT J. HILL, JR/
Primary Examiner, Art Unit 1797